

I CLAIM:

1. A module for use in making a limit switch for selectively making and breaking an electrical circuit which comprises in combination:

a body portion having a plurality of holes, extending therethrough, for mounting said body portion to an object and having first and second ends;

a mechanical operator head mounted on said first end of said body portion;

an actuator arm member for contacting an object operatively mounted on said operator head;

target means mounted in said operator head and operatively connected to said actuator arm member;

said target means being positioned so as to selectively extend into said body portion in operative relationship with a proximity sensor when a proximity sensor is positioned in said second end;

whereby when a module is assembled into a complete limit switch mounted on an object and said actuator arm member contacts a movable portion of said object said target means is moved to actuate a proximity sensor positioned in said body second end to make/break an electrical circuit.

2. The invention as claimed in claim 1 wherein said body portion is a hollow elongated member having a generally rectangular outer cross section;

a cylindrical threaded hole is formed in said second end; and

said target means extends into said hollow elongated member from said first end.

3. The invention as claimed in claim 1 wherein said body portion is a rectangular plastic block with a cylindrical bore extending from said first end to said second end;

    said bore adjacent said second end is internally threaded to receive therein an externally threaded proximity sensor;

    said operator head target means extends into said bore at said first end in juxtaposed operating position with a proximity sensor when positioned in said second end.

4. The invention as claimed in claim 3 wherein said plurality of holes extending through said plastic block are located therein so as to match the positions of the mounting holes in a standard limit switch body member.

5. A limit switch for selectively making and breaking an electrical circuit which comprises in combination:

    a body portion having a plurality of holes, extending therethrough, for mounting said body portion to an object and having first and second ends;

    a mechanical operator head mounted on said first end of said body portion;

    an operator member for contacting an object operatively mounted on said operator head;

    a proximity sensor mounted in said second end of said body portion;

    target means mounted in said operator head and operatively connected to said operator member;

    said target means being positioned so as to selectively extend into operative relationship with said proximity sensor;

    whereby when said operator member contacts an object said target means is moved to actuate said proximity sensor to make or break an electrical circuit.

6. The invention as claimed in claim 5 wherein said body portion is a hollow elongated member having a generally rectangular outer cross section;

a cylindrical threaded hole is formed in said second end;

said proximity sensor is a cylindrical threaded member adapted to thread into said cylindrical threaded hole;

said target means extends into said hollow elongated member from said first end so that upon movement of said operator member said target means is moved to actuate said proximity sensor.

7. The invention as claimed in claim 5 wherein said body portion is a rectangular plastic block with a cylindrical bore extending from said first end to said second end;

said bore adjacent said second end is internally threaded;

said proximity sensor is externally threaded and adjustably mounted in said threaded bore portion;

said operator head target means extends into said bore at said first end in juxtaposed operating position with said proximity sensor positioned in said second end.

8. The invention as claimed in claim 7 wherein said plurality of holes extending through said plastic block are located therein so as to match the positions of the mounting holes in a standard limit switch body member.

9. The invention as claimed in claim 5 wherein said mechanical operator head is a limit switch operator head;

said operator head includes a rotatable shaft extending therefrom; and

said operator member is mounted on said rotatable shaft.

10. The invention as claimed in claim 9 wherein said operator member is an object contacting arm adjustably mounted on said shaft; and

    a roller member is mounted on the object contacting end of said arm.

11. The invention as claimed in claim 6 wherein said operator member is a spring rod.

12. The invention as claimed in claim 5 wherein said operator head includes a linearly retractable member extending therefrom; and

    said operator member is a roller rotatably mounted on the end of said retractable member.

13. The invention as claimed in claim 5 wherein said operator head includes a linearly retractable member extending therefrom; and

    said operator member is a button fixed on the distal end of said retractable member.

14. The method of forming an hybrid mechanical limit switch and proximity sensor switch which comprises:

    placing a mechanical operator head in a first end of a body cavity mold;

    placing a proximity sensor in a second end of a body cavity mold;

    positioning said operator head and proximity sensor in operative relationship within said body cavity mold;

    filling said body cavity mold with a plastic material to form a plastic body partially encapsulating said limit switch and proximity sensor;

    causing said plastic material to form a rigid body member securing said limit switch and proximity sensor in operative relationship therein;

    whereby a unitary hybrid switch is formed.

15. The method as claimed in claim 14 wherein said mechanical operator head is a limit switch operator head having an object contacting operator member operatively mounted thereon.

16. The method as claimed in claim 14 wherein said operator head includes a rotatable shaft extending therefrom and an object contacting arm mounted on said shaft.

17. The method as claimed in claim 14 wherein said operator head includes a linearly retractable member extending therefrom; and

    said object contacting operator member is a roller rotatably mounted on the end of said retractable member.

18. A body module for use in making a limit/proximity switch to make/break an electrical circuit comprising:

    an elongated generally rectangular plastic block having first and second ends;

    a longitudinal cylindrical bore formed in said block extending from first to second end thereof;

    a plurality of transverse mounting holes formed in said block adjacent the corners thereof;

    said mounting holes being formed in a pattern to match the mounting holes in the body portion of a standard limit switch; and

    said cylindrical bore having an internally threaded portion adjacent one end.